The Editor Edinburgh Med. Journal
with the Author's compts

OBSERVATIONS

ON

PLEURITIS AND EMPYEMA

IN CHILDREN,

With Cases.

BY

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FROM THE DUBLIN QUARTERLY JOURNAL OF MEDICAL SCIENCE, NO. VIII.

DUBLIN:
HODGES AND SMITH, GRAFTON-STREET,
BOOKSELLERS TO THE UNIVERSITY.
MDCCCXLVII.

DUBLIN:
PRINTED AT THE UNIVERSITY PRESS,
BY M. H. GILL.

R35500

OBSERVATIONS

ON

PLEURITIS AND EMPYEMA IN CHILDREN.

NOTWITHSTANDING the great attention paid of late years to the diseases of children, so little is known generally on the subject of pleuritis as it affects them, that in one of our standard works it is disposed of by the statement, that "there does not seem to be much tendency to pleuritis in the young subject."(*a*)

With this opinion I cannot coincide. As it is, however, one very commonly entertained in this country, I shall consider it necessary to add to the detail of some very interesting cases the results of investigations made by different continental writers, who have clearly demonstrated that pleuritis is very common in young children.

The frequency of pleuritis, compared to that of other diseases of children, is not easily ascertained. Of 4012(*b*) patients treated in the year 1846 at the London Royal Infirmary for Children, only three were noted as affected with pleuritis; while of 4158(*c*) admitted in 1845 to the Royal Institution for Diseases of Children, in the district of Wieden, Vienna, seventy-six were cases of that disease.

(*a*) Maunsell and Evanson on Diseases of Children.

(*b*) Report for the Year 1846 of the Royal Infirmary for Diseases of Children, London.

(*c*) *Jahresbericht über die Leistungen des Unentgeldlichen Kinder-Krankeninstituts im Polizeibezirke Wieden.* Vienna. 1846.

In London, during the years 1843, 1844, the deaths from pleurisy in children under fifteen years of age amounted to one-sixth of the whole number of deaths at all ages from the same cause(*a*); and of twenty-five(*b*) deaths at all ages from pleurisy, registered in the month of January, 1847, eleven occurred under the age of fifteen years. Facts like these attach to the pleuritis of children a degree of importance very little inferior to that connected with the same disease in adult life.

That even the fœtus *in utero* may be affected with pleuritis would appear from certain cases adduced by Maurieeau, Véron, Cruveilhier(*c*), and Billard(*d*). The infant referred to by Billard having died on the fourth day after birth, presented the costal and pulmonary pleuræ of an obscure red colour, and punctuated. The pleural membrane was thickened, and there existed between it and the lungs cellular adhesions, as closely organized as they are found to be in adults several years after pleurisy. The pleura was also covered with a number of small granulations, and there were adhesions much more recent than the preceding, for they were still of an albuminous consistence.

According to Billard and M. Ch. Baron(*e*) pleurisy is not unfrequent in infants soon after birth. From the summaries made by the latter of the cases on which his valuable memoir is based, it would seem that pleurisy begins oftener during the first five days after birth, than between the fifth day and first month ; that it diminishes in frequency from the first month to the second year; that from the second to the third year it is, on the contrary, more frequent than from the third to the fourth, and especially from the fourth to the fifth year,

(*a*) Sixth annual Report of the Registrar-General.

(*b*) Weekly Tables of Births, &c., registered in London during January, 1847.

(*c*) *Dict. de Méd. et de Chir.* Art. *Pleurisie.*

(*d*) *Traité des Enfants nouveau nés*, p. 545.

(*e*) *De la Pleurisie dans l'Enfance.*

and that it thence becomes more rare from year to year, more particularly between the thirteenth and fourteenth, up to the fifteenth year(*a*).

M. Baron's researches yet make it probable, that in children below the age of two years the liability to pleurisy is much less than in those more advanced in age, for, of 3392 autopsies of children from one to two years old, indubitable pleurisy was found only in 205, or six per cent.; while in 181 autopsies of children from two to fifteen years old, the pleuræ of 158, or eighty-seven per cent., presented signs of inflammation. The pleuræ, however, says M. Baron, in some of the cases comprised in the latter class, may have been affected previously to the second year, which will diminish in some degree the comparatively greater frequency, as above exhibited, of pleuritis in the second period.

With regard to the frequency of simple pleuritis in children there are great diversities of opinion. Many writers, like Underwood, think that "pleuritis rarely, if ever, exists uncomplicated with pneumonia."(*b*) M. Hache found the pleura inflamed in eighty-one out of 194 autopsies, and in not one of these cases was the pleuritis simple. Mr. Crisp(*c*), in forty-one autopsies of children under two years old, discovered pleuritis in six; in one it was simple, in five combined with pneumonia; a combination which, according to Valleix, occurs in one-eighth of the cases of pneumonia in children under two and a half months old, and in one-sixth of those under eight months. This writer considers simple pleurisy to be very rare in young children, and Rilliet and Barthez, although admitting that it exists at all ages, state that they found it in an immense majority of cases after the sixth year(*d*); while Barrier, in all his experience, never observed a case of pleuritis independent

(*a*) *De la Pleurisie dans l'Enfance*, p. 53.

(*b*) Underwood on Diseases of Children, 10th ed. p. 426.

(*c*) London Med. Gaz. Dec. 25th, 1846.

(*d*) *Traité des Maladies des Enfans*, t. i. p. 165.

of pneumonia before that year, and very few between the sixth and tenth, but from the tenth to the fifteenth year it appeared to him to be nearly as common as in adults(*a*).

M. Baron, on the other hand, states(*b*) that coincident pulmonary complications existed in only two-thirds of the cases of pleuritis which occurred in children from one day to one month old; in four-fifths of the cases from one month to one year; and in eight-ninths of those aged from one to fifteen years; whence it would follow, that simple pleurisy is the more rarely met with the nearer the period of puberty. This conclusion of M. Baron's, though opposed to the statements before quoted, is in some degree supported by the opinion of Billard and Berton(*c*), that pleurisy without any pulmonary complication is much more common in very young children than is generally believed.

I am not disposed to agree with M. Baron, that simple pleurisy is so very common in infancy, nor yet with M. Barrier that it is rare before the sixth year; Dr. Stewart(*d*), who fixes the age of three years as that at which "pleurisy becomes as common as in adults," being, in my opinion, nearer the truth, as will appear from the cases I am about to detail.

Of all the products of pleuritic inflammation in children, the most common, sometimes the sole inflammatory lesion, is false membrane; a turbid serosity comes next in order of frequency; while pus is the rarest of all.

As to the seat of pleurisy, in every case with notable effusion observed by Barrier it was unilateral, except in one case of dropsy after scarlatina. In twelve other cases the effusion existed in one pleura alone, being found seven times on the right and five times on the left side; and of the cases in which

(*a*) *Traité des Maladies des Enfans*, t. i. p. 243.

(*b*) *Loc. cit.* p. 59.

(*c*) *Traité des Maladies des Enfants*, p. 335.

(*d*) Practical Treatise on the Diseases of Children. By James Stewart, M. D., New York. 1844.

the unilateral pleurisy was perfectly simple the effusion was five times on the right and once only on the left side; while in the six cases complicated with pneumonia, the effusion was found four times in the left and twice in the right pleura.

These facts of M. Barrier's square with the conclusions of MM. Rilliet and Barthez, viz.: 1. That pleurisy without any pulmonary complication is much more frequently unilateral than double, and (what is also M. Baron's opinion) somewhat more common on the right side than on the left. 2. That when pleurisy is complicated with pneumonia, it is also more generally unilateral than double, but it is then more frequent on the left side than on the right. These conclusions are not confirmed by my experience. Single pleurisy, indeed, seems much more common than double pleurisy; but in all the well-marked cases, to be detailed hereafter, the effusion, whether combined with pneumonia or not, existed on the left side, which inclines me to agree rather with Dr. Copland, that, "pleurisy in every form, in children as well as in adults, is more frequent in the left than in the right side of the chest."

Barrier, Rilliet and Barthez, and Baron, agree in stating, that the quantity of pleuritic effusion is in general very inconsiderable, and on this account, says Baron, "displacement of the heart must be very rare." In not one of the many hundreds of cases seen by him was it observed, and neither had the others, in all their experience, an opportunity for witnessing it. The following cases, therefore, of empyema must be considered as very remarkable, especially the first one, on account of the tender age of the patient, the great amount of effusion and of displacement of the heart, and also for its mode of termination in what is called "empyema of necessity," a termination not very rare in adults, but which is also not very common, as may be gathered from the fact, that Laennec never observed it more than once at any age.

Case I.—*Empyema of the Left Side; great Displacement of the Heart; spontaneous Perforation of the Thoracic Wall; Death.*

George Duffy, aged two years and a half, became a patient of mine at the Institution for Diseases of Children, September 11th, 1845. His mother stated that he had been a very fine and healthy child previously to his illness, then of three weeks' standing, and which she attributed to his having fallen on his side, when in play, over a piece of broken crockery-ware. She never observed any appearance of bruise or injury in consequence, but he passed a restless night, and lying on his left, or supposed injured side, he moaned much, as if in pain. The next day he was peevish and disinclined to leave the bed; and this indisposition, along with a slight cough, still continuing, she at length sought advice, not knowing, as she said, what ailed him. I found him in the following condition:

There was increased heat of skin, and some fever; respiration hurried and oppressed; he had an occasional short, dry cough, which had not altered in character from its commencement; he was indolent and disinclined to move about; the expression of his countenance was perfectly tranquil.

The chest being uncovered, the left side was visibly and greatly enlarged, and remained perfectly unmoved during the respiratory effort; and the entire of this side, which was an inch and a half in circumference larger than the right, presented a remarkable roundness and smoothness, owing to the wide separation and protrusion of the intercostal spaces, as was readily verified by manual examination.

Every part of this side yielded, on percussion, a completely dull, dead sound, and on the application of the stethoscope nothing whatever could be heard in any part of it, except what appeared to be a distant vesicular murmur close to the spine.

The right side of the chest was extremely resonant on per-

cussion, its movements were greatly exaggerated, and the respiratory sounds intensely puerile.

The heart was displaced so as to present behind the sternum; its action was rapid, but its sounds were normal. His usual position in bed was either on his back or left side.

After a fortnight's attendance at the Institution his mother considered him so much improved that she absented herself for a month, at the end of which (24th October) I again saw him in consequence of a tumour which, according to her statement, had made its appearance, four days previously, on the left side of his chest. This tumour corresponded to the intercostal space between the fifth and sixth ribs, being situated somewhat above and behind the usual position of the apex of the heart; in circumference about the size of a half-crown piece; it was slightly inflamed, and very sensitive to the touch, and its centre was prominent. It was quite soft, even at its base, which was not well defined; fluctuation was not distinctly perceptible, but the skin over it became tense when the patient cried. The soreness of this tumour now obliged him to lie on his back or right side.

The enlargement of the left side of the chest was still more marked than before, and the amount of the dislocation of the heart was so much greater that it now beat below, and to the right side of the right mamma, the entire of the chest on the left side, from that point round to the spine, being perfectly dull on percussion; and no sound, normal or abnormal, was discoverable by the stethoscope, except that in the spinal region before mentioned.

The child seemed withal scarcely to suffer; his countenance was calm, cough very slight, but he remained indolent and heavy. His complexion was sallow, and he perspired at night.

On the 2nd of November the integuments over the thoracic tumour gave way, and there escaped much thin, brownish-coloured fluid, which the friends compared to unboiled flummery. The tumour then subsided entirely, its position being

marked by two very small openings, surrounded by a broad, livid redness of the skin, which was widely detached around them, and which concealed the opening through the intercostals.

Having again seen him at the end of a fortnight, I found he was in the habit of perspiring at night about the head, and that he had become much wasted by hectic and diarrhœa; but that he had no longer any tumefaction of the eye-lids and feet, which existed before the empyema opened. The discharge from the chest was not in large quantity, unless when increased by the effort of coughing or of crying.

The heart was now beating at the left side of the right mamma, and the stethoscope indicated no other change. The left side of the chest seemed to be contracting.

On the 1st of December the compressed lung was regaining its natural condition. The sound on percussion in the subclavicular and upper portion of the interscapular region was less dull than before; in other words there was some sonoriety where before there was none whatever. In the latter place there was a sort of hoarse respiratory sound, while under the clavicle a loud bronchial respiration was audible. The heart had retrograded so far as to be now behind the sternum, and its sounds were very perceptible at the left mamma, where before they could not be detected. The left side of the chest was now smaller by measurement than the right, and it was visibly flattened in front beneath the clavicle. He seemed altogether in a much more favourable state. The diarrhœa had ceased; he had but little dyspnœa; the discharge from the side was good thick pus; and, although he was still in the habit of sweating about the head at night, and the eye-lids were puffed in the morning, he had apparently gained in strength, was able to run about, and to use, as the friends said, "whatever was going."

I regretted very much that I was not permitted again to see this child, although, assisted by my friend and colleague, Dr.

M'Clelland, who had accompanied me in my former visits, I made every exertion for the purpose.

Duffy, I learned afterwards, lived till the month of April, 1846.

In the next case the termination was more fortunate; and it is an example of the natural cure of empyema by vicarious secretion from the lungs, a mode of termination first noticed by the late Dr. Greene, and subsequently illustrated by Dr. Robert Mac Donnell, but which, notwithstanding the publications(*a*) of these gentlemen on the subject, I am surprised to find has been totally unnoticed by Dr. Copland in the elaborate article on pleuritis, very recently published in his Dictionary.

Case II.—*Empyema of left Side; Displacement of the Heart; great Contraction of the Side; Recovery.*

Christie Dempsey, a remarkably fine-looking boy, aged three years and one month, complained one evening at the close of the month of July, 1846, of pain in the left hypochondriac region. This pain, for which no cause could be assigned, was followed by fever, raving, great thirst, and complete loss of appetite. Thus affected, he remained for the next month in bed, in which his constant position was on his right side; he frequently moaned piteously, complaining of pain and soreness of the left side of the chest, upon which he often used to lay his hand when asked where he was suffering; and the only method he would allow his mother to adopt for lifting him out of bed, was to place one hand under the nates, while she kept the other on his abdomen, as he could bear no pressure on the chest.

He was also affected with an occasional short, dry cough, and quick and oppressed breathing, which, at times, was distressing. His mother stated, that after he was a fortnight in bed, an ephemeral eruption of red blotches, the size of the top of her thimble, appeared over his body and limbs, and that

(*a*) See Dublin Med. Jour. vol. xvii., p. 68, and vol. xxvi p. 448.

shortly afterwards his scrotum and legs became tumefied, and so remained for a week. The soreness of the chest, short breathing, and decubitus on the right side, disappeared shortly before she applied to the Institution, in the beginning of the month of October.

The only treatment he had been subjected to, up to that time, consisted of a blister to the sternum, which was applied at the very commencement of his illness.

When brought to Pitt-street, the left shoulder was depressed. The left side of the chest was visibly contracted, and, by measurement, was less than the right side by an inch and a quarter. The left side was also flattened in front at its upper part; laterally the ribs felt in apposition, and they remained almost unmoved during respiration.

Percussion yielded a completely dull sound over the entire left side, and, on auscultation, nothing could be heard but tubular respiration, and sonorous rales in the superior portion of the chest, posteriorly and anteriorly, with bronchophony in the interscapular space.

On the right side the respiratory murmur, mixed with sonorous rales, was extremely puerile.

The heart's sounds were most distinctly heard under the sternum, and but feebly in the præcordial region.

Before his illness he had been in appearance a remarkably fine child, enjoying uninterrupted good health, but was now emaciated and wretched-looking. His skin was flaccid, and of a dirty pallid colour, with a tinge of jaundice, which had been present from an early stage of his illness. He usually perspired at night about the head, and over the left side of the chest; his bowels were confined; appetite tolerably good. During the day he coughed seldom, but much on lying down at night. During the night he was in the habit of expectorating about a teacupful of thick, yellow, inodorous sputa; his breath was remarkably offensive, smelling like garlic. His mother considering the nature of his cough peculiar, compared it to

that of an old man ; this peculiarity, probably, depending on the quantity and looseness of the secretion accumulated in the bronchial tubes.

My colleague, Dr. M'Clelland (who kindly transferred Dempsey to my care), and I, had no hesitation in at once pronouncing this case to be of the same description as Duffy's, which was still fresh in our memory. The treatment we adopted consisted in repeatedly painting the side with tincture of iodine, and administering the syrup of ioduret of iron internally.

In the course of a month Dempsey's health was improved; he had regained some of his vivacity, and had become playful. He could lie on either side indifferently, and he looked better, although his complexion was still sallow and yellowish, and the entire of the left side of the chest remained as dull as before. Large mucous rales alone were audible, without the least degree of vesicular respiration. The night cough and expectoration were diminished. The application of the tincture of iodine irritated him so much, that I now directed frictions with the compound camphor liniment every evening.

On the 14th of December a most remarkable change had taken place ; an extensive soft crepitus, like the *crepitus redux* of pneumonia, being very distinctly audible over the entire left side, which now was not more than a quarter of an inch smaller than the right. The ribs no longer felt as if in apposition, and there was considerable resonance on percussion over the upper half of the side. The shoulder was not so low. His looks were greatly improved; his countenance was more animated; he had gained in strength and flesh. The voice was still resonant behind the scapula.

On the 29th the muco-crepitus was still general over the lung; the extent of clearness on percussion was increased; and the natural respiratory sound was audible in the upper portion of the lung.

2nd January, 1847. The dulness of the lower part of the

chest was more limited. Large bronchial rales were now more audible than the previous muco-crepitus. The flattening of the side in front was less remarkable, and there seemed little difference in the height of the shoulders. The heart had nearly returned to its natural position. He still perspired at night, and the sputa, though lessened in quantity, were rather abundant and thick.

On the 5th all bronchial respiration had disappeared; distant sonorous rales were audible, and at the central and lateral part of the left side a sort of crepitus resembling the noise produced by thick parchment when crumpled. This sound seemed quite close to the stethoscope, it occasionally accompanied both inspiration and expiration, and was rendered more distinct by his coughing.

On the 12th this sound was not present, only occasional mucous rales could be detected, which, on the 19th, were again replaced by the dry, parchment-like sound, less marked, however, and only disseminated, as it were, over the central and inferior portions of the side. Both sides were now equal by measurement; percussion detected scarcely any difference in them, and the respiratory murmur, with the exception of some harshness on the left, was equally pure on both sides. The heart had quite returned to its place; he coughed very little; the sputa were very scanty; and he had now become fat and merry.

This child, though he has since had the measles, now enjoys excellent health, and has grown large and stout.

That this was a case of simple pleuritis ending in empyema, which finally disappeared by vicarious secretion, no one, I apprehend, can entertain a serious doubt. The history of its early stage, the subsequent contraction of the side, with displacement of the heart; and the return of the lung in the manner detailed, and of the side, to their natural condition, allow of no other explanation.

Nor should any one imagine that the fine mucous crepitus observed on the return of resonance on percussion, and of par-

tial respiratory murmur, indicated the softening of an hepatized lung. That crepitus, as well as the dry parchment sounds which replaced it, have been lately added to pleuritic *frottement*, as signs indicating the absorption of pleuritic effusions, by MM. Damoiseau(*a*), and Gendrin(*b*), and Dr. R. Mac Donnell(*c*). Damoiseau and Mac Donnell describe the crepitus heard in such cases, as sharp, dry, and exactly resembling that of pneumonia, while M. Gendrin says it is of a humid nature. This discrepancy may be reconciled by the fact of the crepitus assuming different characters, according to the stage of the absorption. Thus, in Dempsey's case, it was moist at first and afterwards dry, yet certainly not of the fine description observed in pneumonia. As to the exact nature of this crepitation, Damoiseau considers it a modification of the pleural friction sound; and M. Gendrin conceives it to be caused by the penetration of air into the portion of the lungs which had been compressed during the existence of the effusion,—a mode of explanation adopted by Dr. Mac Donnell, with this addition, that the latter supposes the cells infiltrated with serum. He says: "If the cells were *fully expanded* and filled with serum, as in the ordinary form of œdema of the lung, the rale would present the loose, subcrepitant character; but, being *partially compressed* and infiltrated, the rale produced by the entrance of air acquires the sharp and fine tone heard in pneumonia." As before mentioned, the rales heard by me were by no means of this fine character, but rather produced the impression of their being caused by the air in the bronchial ramifications passing through a tough mucus, such as we are informed by Hasse they are loaded with while the lung is compressed.

This crepitation, whatever be its exact nature, was also

(*a*) *Archives Générales*, Oct. 1843. (*b*) Dub. Jour., vol. xxvi. p. 452.
(*c*) Lancet, March 8th, 1845. See also Lancet, Jan. 7th, March 15th, and May 3rd, 1845.

present in the following case, which I had the opportunity of observing through the kindness of Dr. M'Clelland.

Case III.—*Empyema of the left Side; Displacement of the Heart; Recovery.*

Ellen Martin, aged four years, a stoutly-formed, healthy-looking child, admitted, February 20th, 1847, into the hospital of the North Dublin Union workhouse, of which she was an inmate, under the care of Dr. M'Clelland.

No accurate account of the history or length of her illness could be obtained; indeed few, on a superficial examination, would be induced to think that her chest was seriously affected. Respiration was rather oppressed, and performed thirty-six times in the minute; she coughed scarcely at all, and had very little expectoration, but seemed much debilitated; the temperature of the skin was low, the extremities cold, and the pulse at the wrist could with difficulty be felt; her face was pallid, but its expression perfectly tranquil; in bed she lay on the left side only, and at once changed to it if placed on her right side; the tongue was red and rather dry.

The left side was more than an inch, by measurement, larger than the right, and was also completely dull on percussion, this dulness extending even to the right side of the sternum, in which position the heart's sounds, nearly inaudible in the præcordial region, were heard most distinctly, and it was possible actually to catch the apex of the heart between the fingers, by pressing them upwards under the cartilages of the false ribs of the right side, a circumstance to which my attention was directed by Dr. Kirkpatrick.

Inspection of the side could not detect any remarkable dilatation except in the left pectoral region, which seemed very prominent when viewed from behind and from above downwards. During the act of respiration there was scarcely any motion perceptible in the ribs of the left side; their expansion

on the right side was, on the contrary, strongly marked; on the former a diffused bronchophony and bronchial respiration alone were audible, together with sonorous rales, which also existed on the right side, where the respiration was otherwise natural, although puerile.

1st March. Pulse was improved, yet still extremely weak and thready in the right wrist, and scarcely perceptible in the left. She could not bear pressure to be made on the right side of the abdomen; cough insignificant.

On the 20th of March she was much better, and was able to lie down on either side indifferently. The fluid was so far absorbed as to have allowed the return of the heart to its natural position. There was a very considerable degree of resonance on percussion posteriorly, as far downwards as the inferior angle of the scapula; anteriorly it was less marked, while laterally the dulness had scarcely altered. The returning respiratory sound was harsh both anteriorly and posteriorly, and accompanied on inspiration and expiration by a dry parchment crepitation, or large crackling sounds. She had lost her previous cough; the fulness of the pectoral region had disappeared; and there was no difference by measurement apparent in the circumference of the two sides.

This child continued to improve rapidly, and in three weeks' time, from the date of last report, was perfectly well, and had quite recovered from a slight contraction of the side and drooping of the shoulder which succeeded the absorption of the pleuritic fluid.

During the first month after her admission into the hospital it was necessary, on account of her great debility, to give her a regular allowance of wine daily. She was ordered a mucilaginous mixture containing acetate of potass, and subsequently the syrup of iodide of iron, along with frictions to the side of an ointment composed of the Ungt. hydriod. potassæ and Ungt. iodinii.

In the following case, to which, in regard to the age at

which it occurred, there is nothing similar on record, the symptoms of pleurisy were still more latent than in the one just given; in fact there was not the least cough throughout, no complaint of pain in the side or anywhere else, and the child could assume any position in bed without inconvenience. The peculiar crepitus which accompanies the absorption of the fluid was not observed in this case, as the child passed from under my observation before the period for its recurrence, in consequence of the mother being obliged to join her husband in England.

Case IV.—*Empyema of left Side; Displacement of the Heart; Recovery.*

Mary Anne Hartfort, aged two years, admitted July 2nd, 1847, under my care, at the Institution for Diseases of Children.

On questioning the mother as to the nature of her child's illness, she stated that three months previously, she had had scarlatina, followed by diarrhœa, which had reduced her in flesh very much; that she never afterwards recovered her vivacity and shewed but little desire to be out of bed; and that during the last two days only her breathing had become very short and oppressed.

Having caused the child to be undressed, I at once observed that there was an extensive effusion into the left side of the chest. This side was manifestly enlarged,—it was half an inch larger than the right; viewed from behind it seemed convex, and smooth laterally; there was a remarkable prominence of the pectoral region, and the entire side was completely dull; the pulsations of the heart could not be detected in the præcordial region, its sounds were most distinct at the right of the sternum; on the left side nothing could be heard but tubular respiration and bronchophony; the respiration, with the exception of being puerile, was natural on the left side. There were seventy inspirations in the minute; pulse

140. She had not had the slightest cough, and was never observed to lie on one side in preference to the other, and of late her ordinary position in bed was on her back. She was much wasted; integuments flabby; complexion pallid; abdomen full; appetite impaired.

On the 7th the respiration was not so much hurried, and on the 17th the left side was scarcely larger than the right. The fulness before observed in the pectoral region was no longer remarkable. The heart's sounds were most distinctly audible between the left mamma and side of the sternum.

On the 22nd, the last time I had an opportunity of seeing this child, she was improved in appearance and in her general health. The sides of the chest were equal by measurement; the heart was beating in its natural position; the expansion of the left side was, however, still defective, but the extreme dulness had diminished under the clavicle, as well as over a part of the side superiorly. The treatment was here the same as in the case preceding.

If these cases, by their having occurred within a brief period, do not indicate a much greater tendency to pleuritis in very young children than is generally believed, they, at least, from their singularity are deserving of notice.

That they were cases of simple primitive pleurisy there can be no doubt, from their history as well as from the admitted and well-known fact, that an extensive pleuritic effusion places the lung out of the pale of inflammation (Laennec, Hasse).

They present some striking peculiarities. In Case I. we have pleuritis produced in an unusual way,—from contusion. Case II. is remarkable for the rapidity with which, after the completion of the absorption, the lung and chest returned to their natural state. Dr. Copland speaks of this contraction *diminishing sometimes*, especially in growing persons, but does not allude to its entire disappearance as even possible. This case also, compared with Case III., goes to shew that the amount of contraction corresponds with the violence of the inflammation.

Cases III. and IV. afford good examples of the latent form of pleurisy common in children, more particularly Case IV., in which there was not only no semblance of pain at any time, but there was not the least cough, nor any prominent sign of chest affection: and Cases II. and IV. shew how little reliance, as a guide to diagnosis, can be placed on the decubitus assumed by children with pleuritis or pleuritic effusions, although adults so affected almost invariably lie in the former instance on the sound, in the latter on the disordered side.

In short, all the four cases demonstrate how possible it is to overlook pleuritis and its effects in children, and, consequently, the necessity there is for instituting in every case a careful physical examination, if it be desirable to avoid making gross blunders in diagnosis and treatment.

"Simple primitive pleurisy," say MM. Rilliet and Barthez, "in children above six years of age, is generally a benign disease, and we may be almost certain to see it end in a return to health in such cases as run an acute course;" for, of twenty-one such cases treated by them, all recovered(*a*). Hache, Constant(*b*), Baudeloque(*c*), and Barrier, entertain a similar opinion. The cases I have given seem to corroborate these views, as well as these observations, that such a form of pleurisy is most common in robust and healthy individuals. Primitive pleuro-pneumonia, on the other hand, is a more dangerous disease than pleurisy or simple pneumonia; for, in Rilliet and Barthez's practice, two out of five of such cases proved fatal; in Barrier's, five out of six; "but the prognosis," say Rilliet and Barthez, "is still more unfavourable when the pleuritis degenerates into the chronic form; and that, accompanied with slight effusion, is much less dangerous than when the latter has produced deformity of the walls of the thorax."(*d*)

There are, however, on record many cases of uncomplicated

(*a*) *Loc. cit.* p. 166. (*b*) *Gazette Médicale de Paris*, 1836, p. 265.
(*c*) *Lancette Française*, 1837, p. 146.
(*d*) *Loc. cit.* p. 167.

empyema in children six years old and upwards, as well as in adults, which ended favourably after the occurrence of deformity of the chest, and even after the evacuation of the fluid through the thoracic walls by an opening, whether spontaneous or artificial. Of the four cases, between seven and nine years of age, in which Dr. Hughes performed the operation of paracentesis(*a*), all recovered; and Heyfelder(*b*) likewise operated with perfect success upon three children, aged from six to seven years, yet the disease in one of them was of four months and a half duration, and the fluid evacuated amounted to six pints (chopines). I think, therefore, that the fatal termination of Case I. affords no reason for an unfavourable prognosis, even at a very early age, in simple primitive pleurisy, if proper care be taken with the patient. The empyema, in Duffy, was clearly uncomplicated; the lung, when I saw him for the last time, three months before death, was rapidly regaining its natural condition, and this accompanied with improvement in his general health; but the stupid parents cared not, as they confessed, whether the child lived or not; and, from the time the abscess appeared in the side, they would not listen to medical advice.

I certainly cannot agree with Mr. Crisp(*c*), that simple pleuritis in children is a disease of "great danger;" nor yet with Dr. Copland, that "its effects are the more to be dreaded, the younger the child which becomes the subject of it"(*d*). Of the seventy-six cases treated at the Institution for Diseases of Children in Vienna, but two died.

We are now in some measure capable of judging how far it is correct or not to say, that "there are no diagnostic marks which distinguish the pleuritis of children from other inflammatory affections of the chest during life"(*e*). No doubt pleurisy in children is frequently not only masked by cerebral and

(*a*) Guy's Hosp. Rep. Nos. 3 and 4. 1844.
(*b*) *Archives Gén. de Méd.* 3e série, t. v. p. 59. (*c*) *Loc. cit.*
(*d*) Dict. Pract. Med., vol. iii. p. 283. (*e*) Maunsell and Evanson, *loc. cit.*

other affections, but is deficient in rational symptoms, which, however, are not so constantly attendant upon the pleuritis of adults as to prevent this being often latent in the latter also(*a*).

The slightest attention to the ordinary signs of pleuritic effusions could not have failed to discover the real nature of the cases I have detailed, with the enlargement of the side and displacement of the heart; but, even at an early period, while the effusion is still moderate in quantity, it is possible, according to Rilliet and Barthez, to ascertain the existence of pleuritis in children by means of the same physical signs observable in that disease in adults.

Of these signs pleuritic *frottement* and ægophony (which is at any age one of little value) are the least constant in children, although Rilliet and Barthez state that they have found the latter so early as the second, third, or fourth year. *Frottement* they never detected before the fifth year. These writers, I may add, state, that pleuritic effusion was pointed out in a child of three years of age by the absence of vibration; but this test, as Dr. Stokes very justly remarks, is inapplicable in many cases of girls and boys, previously to the change of voice, the vocal vibration in them not being sufficiently powerful to be felt by the hand(*b*). Before the end of childhood, or the eighth year, it is, I think, impossible in any case to detect this vibration.

The most valuable and generally available signs, at an early stage, are, bronchial respiration, feebleness but purity of the respiratory murmur, and dulness of sound on percussion.

These writers explain the frequency of bronchial respiration, which they have oftentimes detected in children from two years upwards, by, 1, the proportionably greater narrowness of the chest than in adults; 2, the greater number of respiratory movements; and 3, the small quantity, in certain cases, of the liquid effusion, a cause exemplified in Case I., in

(*a*) Stokes on the Chest, p. 481.

(*b*) On Diseases of the Chest, p. 498.

which the bronchial respiration, at first totally absent, appeared when the great amount of the effusion was diminished.

The bronchial respiration of pleurisy differs from the true souffle of pneumonia by its metallic tone, and more particularly by its progress and duration ; and it is a general rule, remark Rillict and Barthez, that when pleuritic effusion supervenes in a child affected with hepatization of a portion of the lung, sonoriety of the chest totally disappears, and all the abnormal signs are heard with greater intensity ; thus the souffle becomes greatly augmented in distinctness, sometimes it assumes a cavernous tone, and the voice is so resonant as literally to offend the ear.

Such an association of effusion with hepatization existed, it appears to me, in the following case.

Case V.—*Hepatization ; Plueritis ; Recovery.*

Ellen Cheevers, aged three years, came under my care in July, 1845. She was affected with pertussis five weeks, and had been seized by it during convalescence from measles. Her countenance was perfectly natural, and, independently of the paroxysms of the hooping-cough, and a rapid and excited action of the heart, there was nothing, at first sight, to attract particular attention.

On examining the chest, the left side was found to be completely dull, both laterally and posteriorly, and co-extensive with this dulness there was a peculiarly clear tubular respiration and bronchophony distinctly audible. The sound of ordinary respiration was feeble, and mixed with moist rales.

After an attendance of some weeks at the Institution, the affection of the chest had greatly improved, although there remained a dulness of the side, and I lost sight of her until the 23rd of last January, when she again came under my care, in consequence of a smart febrile attack, attended with convulsive paroxysms of coughing, with palpitations. She had dyspnœa,

and her face was bluish and puffy. The left side of the chest was completely dull everywhere, except under the clavicle anteriorly, and posteriorly above the spine of the scapula, yet these parts were dull compared to the same on the right side. A leathery creaking sound accompanied both inspiration and expiration on the left side, and there was very distinct bronchial respiration and bronchophony.

On the 27th the bronchial souffle had altered in tone, and was as distinct to the ear as if produced by blowing through a metallic tube, and this sound (which accompanied both expiration and inspiration), along with a clear broncho-ægophony (if I may use the word), was audible over the greater part of the side, posteriorly and laterally. Near the point of the acromion they were, strange to say, perfectly audible, but they were most distinct over the scapula.

The paroxysms of dyspnœa were sometimes so severe at night, that her mother dreaded her being suffocated. She usually lay on the left side, and complained of its being sore. The peculiar tubular respiration and resonance of the voice, as above described, after having continued a few days, were replaced by ordinary bronchophony, and what may be called laryngeal respiration, for it was precisely similar to what was heard on applying the stethoscope over the child's larynx. The continuance of this sound was not long, and about the middle of February there was a harsh respiratory sound and common resonance of the voice, with pleuritic friction. The dulness on percussion was now much lessened. The fever had subsided, and her general health was improved.

A short time since I ascertained that there was still much dulness on percussion of the side, with a degree of bronchial respiration. Her health was tolerably good.

The peculiar and very remarkable modifications of the voice and respiration, as well as their short duration, plainly indicated the addition of pleuritic effusion to an old hepatization of the

lung. The effusion, in consequence of this state of the lung, could not have been to any large amount; and the side did not at any time undergo the least alteration in its dimensions. There evidently remains still a condensation of the pulmonary tissue, yet recovery, in any shape, seemed at first very unlikely.

Of the above signs of pleuritis, feebleness of the respiratory murmur, and dulness on percussion, are alone applicable to the diagnosis of pleurisy in infants, although Dr. Copland says, that "a rubbing or creaking sound is heard on auscultation," and Mr. Crisp likewise asserts, that "the lungs can be heard moving up and down like the piston of a steam-engine." Rilliet and Barthez, as we have seen, think differently, and I must confess I have never heard what I would call pleuritic frottement in infants, unless it was present in the following case, which affords a good example of a form of pleuritis very common between birth and one year, but in which the stethoscopic signs belonged to, I think, the bronchitis alone.

Case VI.—*Bronchitis; Pleuritis.*

Henry Batt, aged five months; admitted January 22nd, 1847; a very fine child; ill with cough since the 17th. The cough is sharp, painful, restrained, and comes on occasionally in fits, which are terminated by shrill screaming. He keeps the head drawn firmly backwards; the features are contracted, and have a painful expression; breathing quick and jerky; abdominal respiration strongly marked.

When a fit of severe coughing comes on he appears in the greatest pain; the face becomes congested, eye-brows contracted, eyes staring and watery, limbs flexed, and hands clenched, and he shrugs and works with his shoulders as if something sharp was sticking in his back.

No decided dulness; respiration is feebly audible, and there are rales posteriorly, giving the impression of the air in the minute bronchial ramifications passing through a viscid fluid.

I directed a leech to be placed on the back of the hand, and ordered powders composed of calomel and hippo, with a cough mixture containing syrup of squills and hippo wine.

He was not again brought back until the 26th, as he had obtained almost instant relief from the leech, which had not been applied many minutes when he fell asleep. He was then animated and playful; and the head no longer flexed backwards; cough very slight, free, and unrestrained: the respiration pure, but feeble, as if the lungs were not filled on inspiration.

29th. The respiratory sound is now puerile and natural. He is quite well.

The peculiar symptoms here present are very common in infants, and arise, it appears to me, from pleuritis supervening on acute bronchitis, which in them is, perhaps, the sole cause of the former. The fixed position of the head backwards, lately noticed by Mr. Crisp as a symptom of pleuritis, I have been long in the habit of observing in such cases as the above, and it seems to arise from an instinctive effort to avoid painful motion of the chest, by fixing the ribs, and giving full play to the abdominal respiration. This position of the head in pleuritis may be distinguished from that attending cerebro-spinal arachnitis, or other affections of the nervous centres, by all change of posture in pleuritis being followed by great uneasiness and screaming, while in the latter the infant is not so restless, nor crying constantly, especially when moved or held erect, as in pleuritis.

When pleurisy coexists, as in the preceding case, with acute bronchitis or pneumonia, active treatment is absolutely necessary on account of these latter, but from the tendency of simple pleurisy to be in children subacute, *ab initio*, or soon to degenerate into the chronic form, depletory measures are often, even at the commencement of it, inapplicable.

Constant and Baudeloque consider recovery from simple

pleurisy to be the general rule, and that irrespectively of the quantity of effusion, or whether treatment be had recourse to or not. In reference to the latter part of this opinion I can only say, that I am convinced of the utility of the treatment pursued in Cases II., III., and IV., as well as that the total neglect of due care conduced, in a great measure, to the fatal termination of Case I.

THE END.